Space Weather Forecast

Issued on Thursday 13 February 2025 at 12:37 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor Geomagnetic Storm (G1) to end UTC working week. Rising chance of Minor Radio Blackouts (R1).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity rose to Moderate, with the peak X-ray flare a Moderate-class at 13/1109UTC from a large and growing sunspot region in the southwest. There are up to six sunspots on the current facing side of the Sun, although monitoring has been slightly degraded by a period of unavailability of higher resolution satellite imagery (with ground-based imagery used as an alternative). The main group (responsible for the peak flare) saw strong growth in the last 36 hours or so. The other potential sunspot region of note lies in the southeast, which has been more stable in terms of overall size, but shows a relatively large leading spot group.

No Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery. Imagery to determine any CME from the Moderate-class flare is not yet available.

Solar Wind / Geomagnetic Activity: Solar winds showed a waning connection to a fast wind in the period - likely the fading of one fast wind, and perhaps a tenuous link developing into a second later in the current UTC morning. Any segue from one to the other may be indistinct as the two features may form an east-west continuum on the Sun (i.e. the are only marginally distinct features).

Solar wind speeds started elevated, but gradually waned to slightly elevated levels over the 24 hours, before a slight uptick by the period's end. The number of particles comprising the solar wind and their associated magnetic field were both unremarkable.

The net result of the above solar wind measures was for provisionally Unsettled to Active geomagnetic activity, peaking just below G1 Minor Storm in the 03-06UTC interval.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Activity will most likely be low, but with a daily chance of isolated Moderate-class X-ray flares.

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Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Current fast winds are expected to become further enhanced in the remainder of day 1 and into day 2 (13-14 February), perhaps reaching elevated to strong speeds. These winds are likely to continue over the UTC weekend.

Initial Unsettled to Active geomagnetic activity should become Active with a Chance of G1 Minor Storms to end the current UTC working week, as a second fast wind more fully connects with Earth. There remains a slight chance of Minor Geomagnetic Storm G1 over the ensuing weekend as the fast wind matures.

Energetic Particles / Solar Radiation: High energy proton flux is forecast to persist at background levels. There is now a marginally increased slight chance of Minor Solar Radiation Storm S1 as a result of the Moderate-class X-ray flare late in the current 24-hour reporting period (i.e. too soon for any solar radiation enhancement to manifest near Earth).

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	50	40	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	40	50	50	50
Very Active	R3-R5 (X Class)	No	1	1	1	1

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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